

## CLAIM AMENDMENTS

It is respectfully requested that the claims be amended without prejudice, without admission, without surrender of subject matter, and without intention of creating any estoppel as to equivalents, as follows. This listing of claims will replace all prior versions, and listings, of claims in the application.

### Listing of Claims:

1-72 (currently amended). A method of generating a sperm cell insemination sample, comprising:

obtaining sperm cells ~~from a male of a species~~ of mammal;

generating a fluid stream having flow characteristics, ~~wherein said fluid stream comprises a sheath fluid selected from a group consisting of phosphate buffered saline (PBS), citrate buffer, 2.9% sodium citrate, HEPES buffer, TRIS-based sheath fluid, and combinations thereof;~~

selecting at least one desired sperm cell fertility characteristic, said at least one desired sperm cell fertility characteristic selected from a group consisting of: sperm cell motility, sperm cell viability, oocyte cleavage rate, ~~pregnancy rate~~, and oocyte blastocyst rate, and pregnancy rate;

altering said flow characteristics of said fluid stream to adjust fluid stream pressure to between about 30 psi and about 40 psi, said fluid stream pressure based on said at least one desired sperm cell fertility characteristic, ~~wherein said fluid stream pressure is adjusted to a pressure selected from a group consisting of about 30 psi when sperm cell motility is selected, about 40 psi when sperm cell motility is selected, about 30 psi when sperm cell viability is selected, about 40 psi when viability is selected, about 40 psi when oocyte cleavage rate is selected, about 40 psi when oocyte blastocyst rate is selected, and about 30 psi when pregnancy rate is selected;~~

subjecting said sperm cells ~~from said male of said species~~ of said mammal to said fluid stream having a ~~selected~~ selected said fluid stream pressure associated with ~~[[said]]~~ selected said at least one desired fertility characteristic;

entraining said sperm cells into said fluid stream;

controlling said at least one desired sperm cell fertility ~~eharaeteristies~~ characteristic selected through adjustment of said fluid stream pressure; and

generating a sperm cell insemination sample having controlled sperm cell fertility characteristics reflecting said selected at least one desired sperm cell fertility characteristic.

2 (previously presented). A method of generating a sperm cell insemination sample a described in claim 1, wherein said ~~species-of~~ mammal is selected from the group consisting of a bovine ~~species-of~~ mammal, an equine ~~species-of~~ mammal, an ovine ~~species-of~~ mammal, a canine ~~species-of~~ mammal, a feline ~~species-of~~ mammal, a swine ~~species-of~~ mammal, a marine ~~species-of~~ mammal, a ~~deer-species-of~~ cervid mammal, a primate ~~species-of~~ mammal, a ~~goat-species-of~~ caprid mammal.

3 (original). A method of generating a sperm cell insemination sample a described in claim 1, wherein said fluid stream comprises a sheath fluid stream.

4-7 (canceled).

8 (original). A method of generating a sperm cell insemination sample a described in claim 1, wherein said fluid stream is generated within a flow cytometer or cell sorter.

9-30 (canceled).

31 (previously presented). A method of generating a sperm cell insemination sample a described in claim 1, wherein said pregnancy rate of a female of said bovine species of mammal inseminated with a bovine sperm cell insemination sample having controlled sperm cell fertility characteristics.

32-38. (canceled)

39 (previously presented). A method of generating a sperm cell insemination sample a

described in claim 31, wherein said bovine sperm cell insemination sample having controlled sperm cell fertility characteristics contains between about  $1 \times 10^5$  and  $2 \times 10^7$  of bovine sperm cells.

40 (previously presented). A method of generating a sperm cell insemination sample a described in claim 31, wherein said bovine sperm cell insemination sample having controlled sperm cell fertility characteristics contains between about  $1 \times 10^6$  and  $3 \times 10^6$  of bovine sperm cells.

41 (withdrawn). A method of generating a sperm cell insemination sample a described in claim 1, further comprising the step of staining said sperm cells.

42 (withdrawn). A method of generating a sperm cell insemination sample a described in claim 41, wherein said step of staining said sperm cells comprises staining said sperm cells with Hoechst 33342.

43 (withdrawn). A method of generating a sperm cell insemination sample a described in claim 1, further comprising generating droplets in said fluid stream some of which contain one each of said sperm cells.

44 (withdrawn). A method of generating a sperm cell insemination sample a described in claim 43, further comprising differentiating said sperm cells based upon a sex characteristic.

45(withdrawn). A method of generating a sperm cell insemination sample a described in claim 44, wherein said step of differentiating said sperm cells based on a sex characteristic comprises differentiating said sperm cells based on amount of DNA content.

46(withdrawn). A method of generating a sperm cell insemination sample a described in claim 44 wherein said step of differentiating said sperm cells based on a sex characteristic comprises differentiating said sperm cells based on sperm head volume.

47 (withdrawn). A method of generating a sperm cell insemination sample a described in claim 44, further comprising the step of separating s sperm cells based on said sex characteristic.

48 (withdrawn). A method of generating a sperm cell insemination sample a described in claim 47, further comprising the step of collecting said sperm cell insemination sample having controlled sperm cell fertility characteristics in a collection container.

49 (withdrawn). A method of generating a sperm cell insemination sample a described in claim 48, wherein said step of collecting said sperm cell insemination sample having controlled sperm cell fertility characteristics in a collection container comprises collecting a sex selected sperm cell insemination sample in said collection container.

50 (withdrawn). A method of generating a sperm cell insemination sample a described in claim 49, wherein said sex selected sperm cell insemination sample comprises an artificial insemination sex selected sperm cell insemination sample.

51 (withdrawn). A method of generating a sperm cell insemination sample a described in claim 49, wherein said sex selected sperm cell insemination sample comprises an in vitro fertilization sex selected sperm cell insemination sample.

52 (withdrawn). A method of generating a sperm cell insemination sample a described in claim 49, wherein said sex selected sperm cell insemination sample comprises an intracytoplasmic sex selected sperm cell injection sample.

53-61 (canceled).

62 (withdrawn). A method of generating a sperm cell insemination sample a described in claim 1 further comprising: obtaining sperm cells from a least two males of a species of mammal; exposing said sperm cells from each of said at least two males of said species to

substantially the same flow cytometric treatment; fertilizing oocytes in vitro with a mixture of substantially equal numbers of said sperm cells from each of said at least two males of said species of mammal exposed to substantially the same flow cytometric treatment; collecting embryos generated through said in vitro fertilization of said oocytes; determining which of said at least two males of said species of mammal sired each embryo; and ranking comparative fertility of said at least two males of said species of mammal based on comparative number of embryos sired by each of said at least two males.

63 (withdrawn). A method of generating a sperm cell insemination sample as described in claim 1, further comprising: obtaining sperm cells from said male of said species of mammal; providing Y-chromosome bearing sex selected sperm cells exposed to first treatment conditions; providing X-chromosome bearing sex selected sperm cells exposed to second treatment conditions; generating an insemination sample having a ratio of said Y-chromosome bearing sex selected sperm cells exposed to said first treatment conditions and said X-chromosome bearing sex selected sperm cells exposed to second treatment conditions; inseminating at least one female of said species of mammal with said insemination sample having said ratio of said Y-chromosome bearing sperm cells exposed to said first treatment conditions and said X-chromosome bearing sperm cells exposed to second treatment conditions; producing offspring from said at least one female of said species of mammal; and assessing fertility of said sex selected sperm cells by comparison of sex ratio of offspring of said at least one female of said species of mammal to said ratio of said Y-chromosome bearing sperm cells exposed to first treatment conditions and X-chromosome bearing sperm cells exposed to second treatment conditions

64 (withdrawn). A method of generating a sperm cell insemination sample as described in claim 1, further comprising: obtaining sperm cells from at least two males of a species of mammal; exposing said sperm cells from each of said at least two males of said species to substantially the same flow cytometric treatment; inseminating at least one female of said species of mammal with a mixture of substantially equal numbers of said sperm cells from each of said at least two males of said species of mammal exposed to substantially the same flow cytometric treatment; collecting embryos from said at least one female of said species of

mammal; determining which of said at least two males of said species of mammal sired each embryo; and ranking comparative fertility of said at least to males of said species of mammal based on comparative number of embryos sired by each of said at least two males.

65 (currently amended). A method of generating a sperm cell insemination sample, comprising:

- obtaining sperm cells from a male of a species of mammal;

- generating a fluid stream having flow characteristics;

- selecting at least one desired sperm cell fertility characteristic, said desired sperm cell fertility characteristic selected from a group consisting of motility, viability, cleavage rate, pregnancy rate, and blastocyst rate;

- altering flow characteristics of said fluid stream to adjust fluid stream pressure between about 30 psi and 40 psi based on said at least one desired sperm cell fertility characteristic, wherein said fluid pressure is adjusted to a pressure selected from a group consisting of 30 psi when sperm cell motility is selected, about 40 psi when sperm cell motility is selected, about 30 psi when sperm cell viability is selected, about 40 psi when sperm cell viability is selected, about 40 psi when oocyte cleavage rate is selected, 40 psi when viability is selected, 40 psi when cleavage rate is selected; 40 psi when blastocyst rate is selected, and 30 psi when pregnancy rate is selected;

- subjecting said sperm cells from said male of said species of said mammal to said fluid stream having a selected fluid stream pressure associated with said selected fertility characteristic;

- entraining said sperm cells into said fluid stream;

- controlling sperm cell fertility characteristics through adjustment of said fluid stream pressure; and

- generating a sperm cell insemination sample having controlled sperm cell fertility characteristics reflecting [[said]] selected said at least one desired sperm cell fertility characteristic.

66 (previously presented). A method of generating a sperm cell insemination sample a described in claim 65, wherein said species of mammal is selected from the group consisting

of a bovine species of mammal, an equine species of mammal, an ovine species of mammal, a canine species of mammal, a feline species of mammal, a swine species of mammal, a marine species of mammal, a deer species of mammal, a primate species of mammal, a goat species of mammal.

67 (previously presented). A method of generating a sperm cell insemination sample a described in claim 65, wherein said fluid stream comprises a sheath fluid stream.

68 (previously presented). A method of generating a sperm cell insemination sample a described in claim 65, wherein said fluid stream comprises a sheath fluid selected from the group consisting of phosphate buffered saline (PBS), citrate buffer, 2.9% sodium citrate, HEPES buffer, TRIS-based sheath fluid, and combinations thereof.

69 (previously presented). A method of generating a sperm cell insemination sample a described in claim 65, wherein said fluid stream is generated within a flow cytometer or cell sorter.

70 (previously presented). A method of generating a sperm cell insemination sample a described in claim 65, wherein said pregnancy rate comprises a pregnancy rate of a female of a bovine species of mammal inseminated with a bovine sperm cell insemination sample having controlled sperm cell fertility characteristics.

71 (previously presented). A method of generating a sperm cell insemination sample a described in claim 31, wherein said bovine sperm cell insemination sample having controlled sperm cell fertility characteristics contains between about  $1 \times 10^5$  and  $2 \times 10^7$  of bovine sperm cells.

72 (previously presented). A method of generating a sperm cell insemination sample a described in claim 31, wherein said bovine sperm cell insemination sample having controlled sperm cell fertility characteristics contains between about  $1 \times 10^6$  and  $3 \times 10^6$  of bovine sperm cells.